ZXMN10A08E6

100V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D $T_A = 25°C$
100V	0.25Ω	1.9A

Description and Applications

This MOSFET utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed, this makes it ideal for high efficiency power management applications.

- DC-DC Converters
- Power management functions
- Disconnect Switches
- Motor control

Features and Benefits

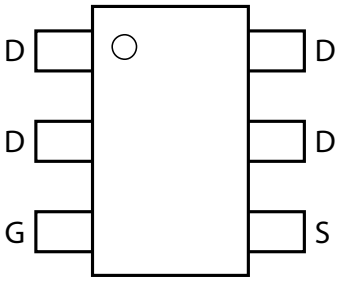
- Low on-resistance
- Fast switching speed
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

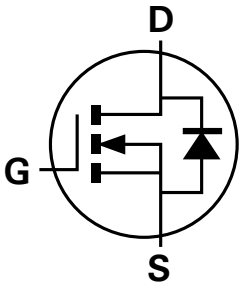
- Case: SOT23-6
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Matte Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.015 grams (approximate)

SOT23-6

TOP VIEW



Package Pin Out

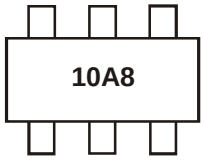


Equivalent Circuit

Ordering Information

Product	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN10A08E6TA	7	8	3,000
ZXMN10A08E6TC	13	8	10,000

Marking Information



10A8 = Product Type Marking Code

Maximum Ratings @T_A = 25°C unless otherwise specified

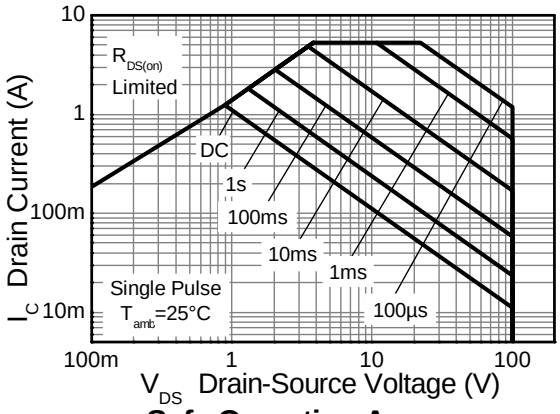
Characteristic			Symbol	Value	Unit
Drain-Source voltage			V_{DSS}	100	V
Gate-Source voltage			V_{GS}	±20	V
Continuous Drain current	V_{GS} = 10V	(Note 2) T_A = 70°C (Note 2) (Note 1)	I_D	1.9 1.5 1.5	A
Pulsed Drain current (Note 3)			I_{DM}	8.6	A
Continuous Source current (Body diode) (Note 2)			I_S	2.5	A
Pulsed Source current (Body diode) (Note 3)			I_{SM}	8.6	A

Thermal Characteristics

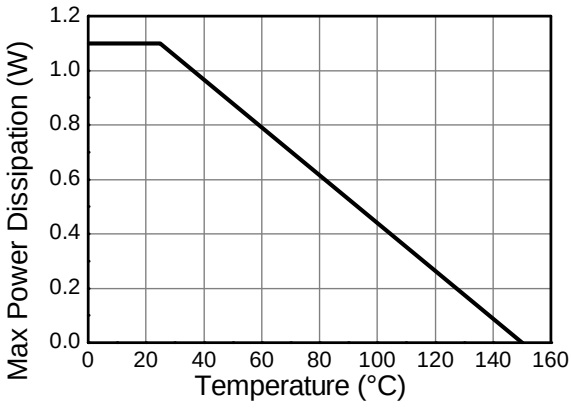
Characteristic		Symbol	Value	Unit
Power dissipation Linear derating factor	(Note 1)	P_D	1.1 8.8	W mW/°C
Power dissipation Linear derating factor	(Note 2)		1.7 13.6	W mW/°C
Thermal Resistance, Junction to ambient	(Note 1)	$R_{\theta JA}$	113	°C/W
	(Note 2)		73	
Operating and storage temperature range		T_J, T_{STG}	-55 to 150	°C

Notes:
1. For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
2. For a device surface mounted on FR4 PCB measured at t ≤ 5 sec.
3. Repetitive rating 25mm x 25mm FR4 PCB, D = 0.02, pulse current 300µs - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph

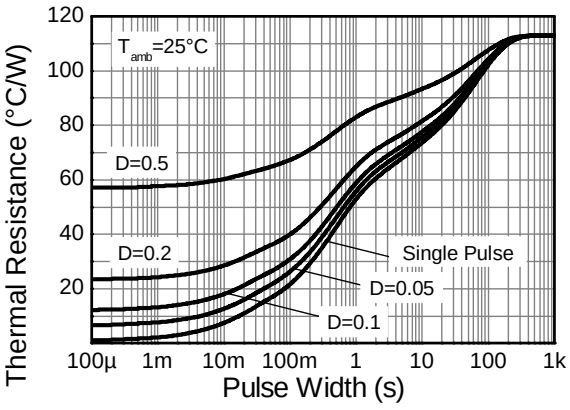
Thermal Characteristics



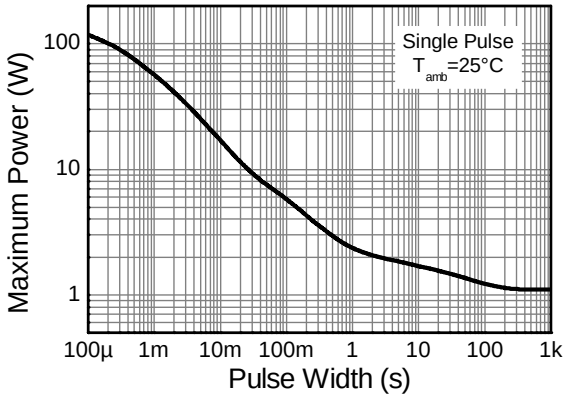
Safe Operating Area



Derating Curve



Transient Thermal Impedance



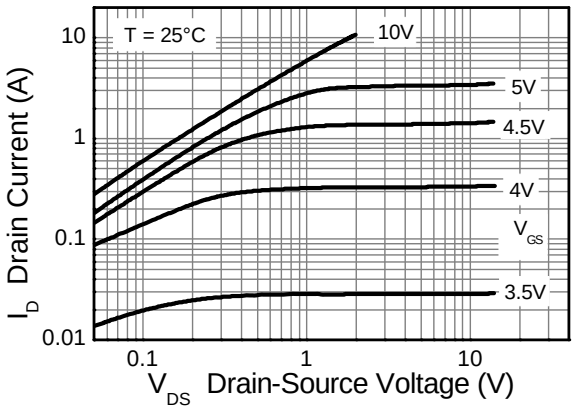
Pulse Power Dissipation

Electrical Characteristics @T_A = 25°C unless otherwise specified

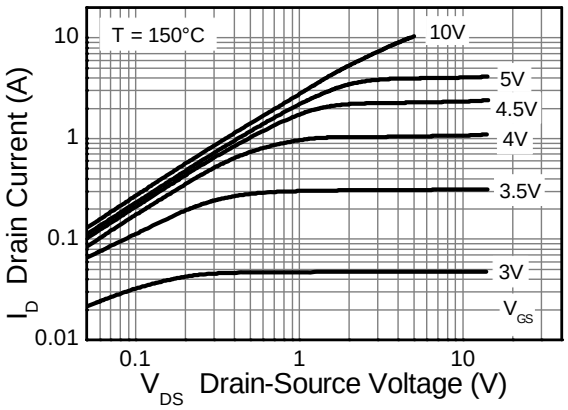
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	100	—	—	V	I_D = 250μA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	0.5	μA	V_{DS} = 100V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	2	—	4	V	I_D = 250μA, V_{DS} = V_{GS}
Static Drain-Source On-Resistance (Note 4)	$R_{DS\ (ON)}$	—	—	0.25 0.30	Ω	V_{GS} = 10V, I_D = 3.2A V_{GS} = 6V, I_D = 2.6A
Forward Transconductance (Notes 4 & 6)	g_{fs}	—	5.0	—	S	V_{DS} = 15V, I_D = 3.2A
Diode Forward Voltage (Note 4)	V_{SD}	—	0.87	0.95	V	I_S = 3.2A, V_{GS} = 0V
Reverse recovery time (Note 6)	t_{rr}	—	27	—	ns	I_F = 1.2A, di/dt = 100A/μs
Reverse recovery charge (Note 6)	Q_{rr}	—	32	—	nC	
DYNAMIC CHARACTERISTICS (Note 6)						
Input Capacitance	C_{iss}	—	405	—	pF	V_{DS} = 50V, V_{GS} = 0V f = 1MHz
Output Capacitance	C_{oss}	—	28.2	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	14.2	—	pF	
Total Gate Charge	Q_g	—	4.2	—	nC	V_{DS} = 50V, V_{GS} = 5V I_D = 1.2A
Total Gate Charge	Q_g	—	7.7	—	nC	V_{DS} = 50V, V_{GS} = 10V I_D = 1.2A
Gate-Source Charge	Q_{gs}	—	1.8	—	nC	
Gate-Drain Charge	Q_{gd}	—	2.1	—	nC	
Turn-On Delay Time (Note 5)	$t_{D(on)}$	—	3.4	—	ns	V_{DD} = 30V, V_{GS} = 10V I_D = 1.2A, $R_G \cong$ 6.0Ω
Turn-On Rise Time (Note 5)	t_r	—	2.2	—	ns	
Turn-Off Delay Time (Note 5)	$t_{D(off)}$	—	8	—	ns	
Turn-Off Fall Time (Note 5)	t_f	—	3.2	—	ns	

Notes: 4. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%
5. Switching characteristics are independent of operating junction temperatures.
6. For design aid only, not subject to production testing.

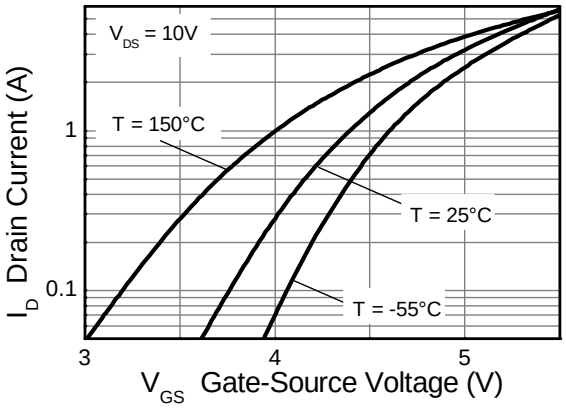
Typical Characteristics



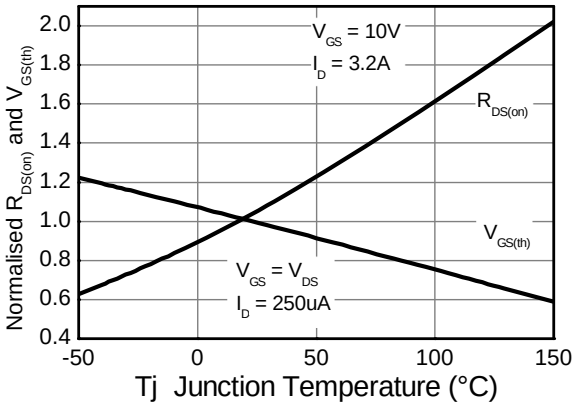
Output Characteristics



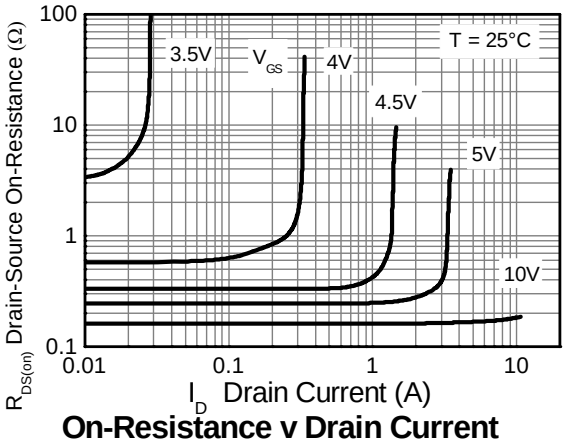
Output Characteristics



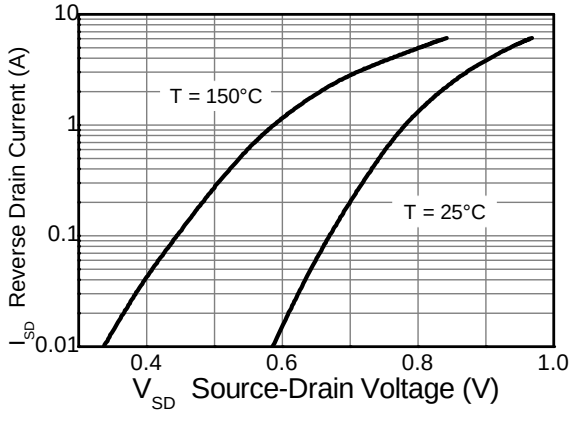
Typical Transfer Characteristics



Normalised Curves v Temperature

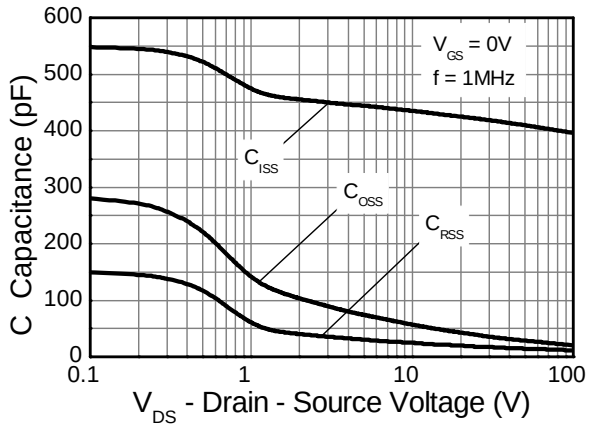


On-Resistance v Drain Current

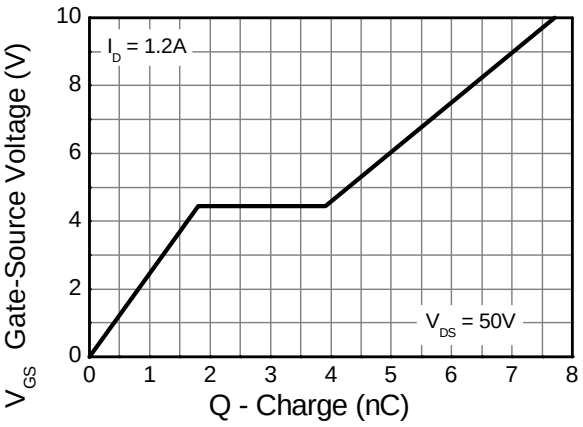


Source-Drain Diode Forward Voltage

Typical Characteristics - continued

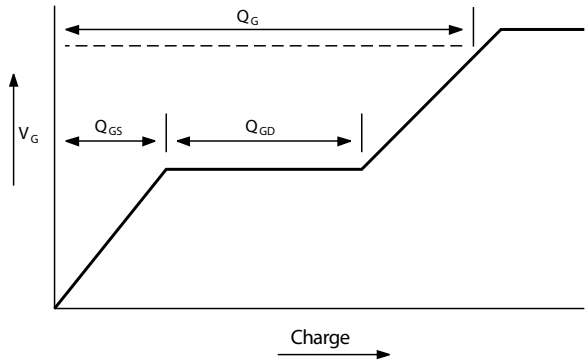


Capacitance v Drain-Source Voltage

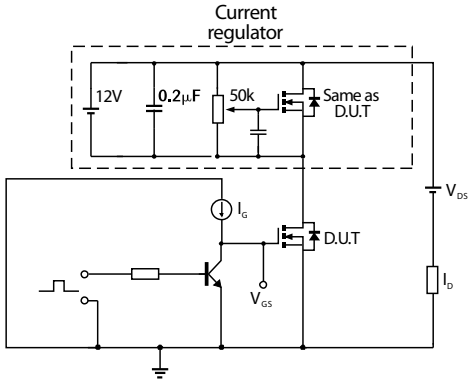


Gate-Source Voltage v Gate Charge

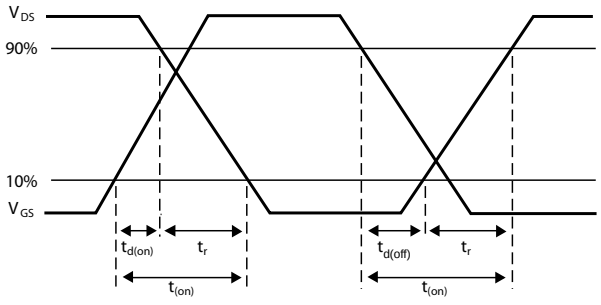
Test Circuits



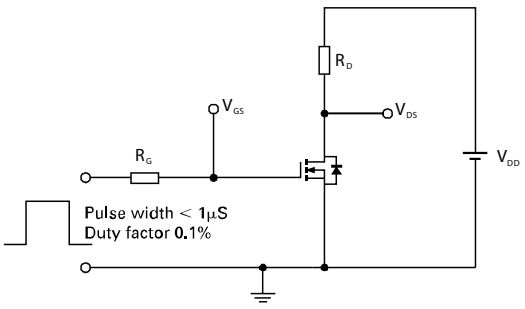
Basic gate charge waveform



Gate charge test circuit

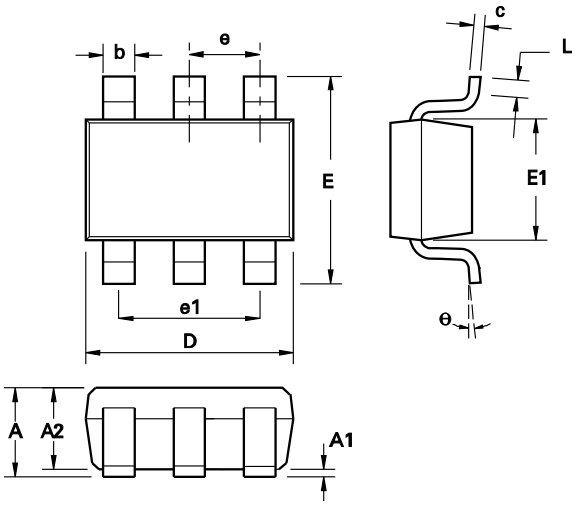


Switching time waveforms



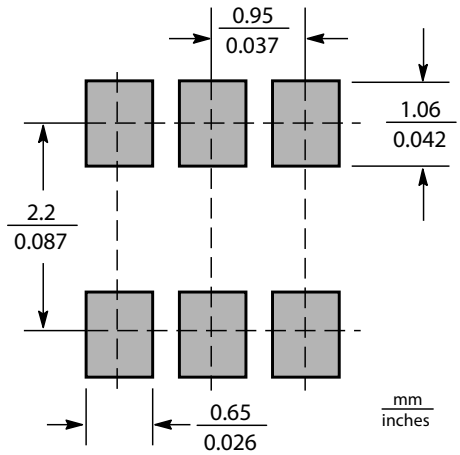
Switching time test circuit

Package Outline Dimensions



DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.45	0.35	0.057
A1	0.00	0.15	0	0.006
A2	0.90	1.30	0.035	0.051
b	0.35	0.50	0.014	0.019
C	0.09	0.20	0.0035	0.008
D	2.80	3.00	0.110	0.118
E	2.60	3.00	0.102	0.118
E1	1.50	1.75	0.059	0.069
L	0.10	0.60	0.004	0.002
e	0.95 REF		0.037 REF	
e1	1.90 REF		0.074 REF	
L	0°	10°	0°	10°

Suggested Pad Layout



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